Please amend the claims as follows. This listing of claims will replace all prior versions, and

Listings of Claims in the application:

Listing of Claims:

1. (Currently Amended) A computer implemented method of managing computer resources comprising:

accessing an amount of computer resources allocated to a workload of a computer system<u>, the workload exists within a user space and includes a plurality of running processes, the plurality of running processes are a subset of all processes that are running in the user space</u>;

monitoring computer resource usage of said workload<u>, the monitoring is performed from within said workload and only for resources associated with said workload</u>; and

determining a range of computer resources to make available for ~~other~~ use <u>by other workloads</u> provided said computer resource usage of said workload exceeds said amount of computer resources allocated to said workload, wherein said monitoring and said determining occur within ~~a~~ <u>the</u> user space<u>, the computer resources being made available to other workloads by paging out least recently used physical memory pages assigned to said workload</u>.

2. (Original) The method of claim 1 wherein said computer resources comprises physical memory.

3. (Original) The method of claim 2 wherein said determining comprises determining if a page of physical memory utilized by said workload has been accessed by said workload within a predetermined period of time.

4. (Original) The method of claim 3 wherein said determining if a page of physical memory utilized by said workload has been accessed by said workload within a predetermined period of time comprises determining if said page has been accessed by said workload since a previous determination of whether said page had been accessed by said workload.

5. (Original) The method of claim 1 wherein said computer resources comprises virtual memory.

6. (Original) The method of claim 1 wherein said computer resources comprises central processing unit time.

7. (Original) The method of claim 1 wherein said computer resources comprises input/output space.

8. (Original) The method of claim 1 wherein said computer resources comprises network bandwidth.

9. (Currently Amended) A computer implemented method comprising:

monitoring usage of a computing resource utilized by a workload wherein said monitoring is performed by a process within a user space and the process monitors the user space only, the workload includes a plurality of running processes, the plurality of running processes are a subset of all processes that are running in the user space;

responsive to exceeding a limit on utilization of said computing resource, decreasing usage of said computing resource by said workload.

10. (Original) The method of claim 9 wherein said computing resource comprises physical memory.

11. (Original) The method of claim 10 wherein said decreasing usage of said computing resource comprises paging a portion of said physical memory assigned to said workload out of said physical memory.

12. (Original) The method of claim 11 wherein said portion of said physical memory comprises a least recently used portion of said physical memory assigned to said workload.

13. (Original) The method of claim 9 wherein said decreasing usage does not halt operation of said workload.

14. (Original) The method of claim 9 wherein said decreasing usage is initiated by a process of said workload.

15. (Original) The method of claim 9 wherein said process that performs said monitoring is not an operating system kernel process.

16. (Currently Amended) A computer implemented method for memory management of a workload from within the workload comprising:

accessing a list of memory pages assigned to said workload in a user space, the workload includes a plurality of running processes, the plurality of running processes are a subset of all processes that are running in the user space;

responsive to a request from a first process of said workload for memory which exceeds a predetermined memory limit for said workload, selecting a plurality of memory pages from said list of memory pages, wherein the plurality of memory pages includes least recently used memory pages assigned to the workload; and

initiating a second process within [[a]] the user space to page out said plurality of memory pages and wherein said selecting occurs within said user space.

17. (Original) The method of claim 16 wherein said accessing, selecting and initiating are performed by said second process within said workload.

18. (Original) The method of claim 16 wherein said second process is not an operating system kernel process.

19. (Original) The method of claim 16 wherein said second process is loaded into a user space.

20. (Original) The method of claim 16 wherein said plurality of memory pages comprises memory pages that are least recently used.

21. (Original) The method of claim 20 wherein said plurality of memory pages comprises memory pages that are least recently used by said workload.

22. (Original) The method of claim 20 wherein said page out of said plurality of least recently used memory pages reduces a number of memory pages assigned to said workload to below said memory limit.

23. (Original) The method of claim 20 wherein said plurality of least recently used memory pages comprises the minimum number of memory pages to reduce said number of memory pages assigned to said workload below said memory limit.

24. (Original) The method of claim 16 wherein at least a portion of said workload continues to operate subsequent to said initiating.

25. (Original) The method of claim 16 wherein said initiating is not performed by an operating system kernel process.

26. (Currently Amended) A computer-usable medium having computer-readable program code embodied therein for causing a computer system to perform a method, said method comprising:

accessing an amount of computer resources allocated to a workload of a computer system, the workload exists within the user space and includes a plurality of running processes, the plurality of running processes are a subset of all processes that are running in the user space;

monitoring computer resource usage of said workload; and

determining a range of computer resources to make available for ~~other~~ use <u>by other</u> <u>workloads</u> provided said computer resource usage of said workload exceeds said amount of computer resources allocated to said workload, wherein said monitoring and said determining ~~occur~~ <u>performed</u> within said workload <u>and resources assigned to the workload only are</u> <u>considered, the plurality of computer resources being made available to other workloads by</u> <u>paging out least recently used physical memory pages assigned to said workload</u>.

27. (Original) The computer-usable medium of claim 26 wherein said computer resources comprise memory.

28. (Original) The computer-usable medium of claim 27 wherein said memory comprises physical memory.

29. (Original) The computer-usable medium of claim 28 wherein said determining comprises determining if a page of physical memory utilized by said workload has been accessed by said workload within a predetermined period of time.

30. (Original) The computer-usable medium of claim 29 wherein said determining if a page of physical memory utilized by said workload has been accessed by said workload within a predetermined period of time comprises determining if said page has been accessed by said workload since a previous determination of whether said page had been accessed by said workload.

31. (Original) The computer-usable medium of claim 30 wherein a page is identified as least recently used if said page has not been accessed by said workload since a previous determination of access for said page indicated that said page had been accessed by said workload.

32. (Currently amended) A computer implemented method <u>for memory management</u> <u>of a workload from within the workload</u> comprising:

scanning pages for a first workload of a computer to determine if each of said pages was accessed since a last scan;

setting bits indicative of the result of said scanning within a scoreboard related to said first workload; and

repeating said scanning and said setting for a second workload, wherein said scanning and said setting occur within a user space of said computer, wherein the first workload and the second workload exist within the user space and each includes a plurality of running processes, the plurality of running processes are a subset of all processes that are running in the user space.

33. (Original) The method of claim 32 wherein said scanning comprises checking said pages according to an order inherent to a list of said pages.

34. (Original) The method of claim 33 further comprising paging out a plurality of pages utilized by said first workload responsive to said determining.

35. (Original) The method of claim 32 further comprising determining if the number of pages utilized by said workload exceeds a predetermined limit.

36. (Currently amended) A computer implemented method comprising:

accessing memory usage for a workload and examining page usage for each process of said workload, the workload exists within a user space and includes a plurality of running processes, the plurality of running processes are a subset of all processes that are running in the user space;

aggregating usage of said each process to determine an aggregate usage for said workload;

if said aggregate usage does not exceed a memory utilization limit for said workload, repeating said accessing and aggregating for a next workload;

if said aggregate usage exceeds said memory utilization limit for said workload, determining least recently used pages based on accessed bits associated with said workload;

if said aggregate usage exceeds said memory utilization limit for said workload, supplying a range of least recently used pages in a system call to an operating system kernel for evicting said range of least recently used pages to reduce resource usage by said workload; and

retaining at least partial operation of said workload during said page evicting.

37. (Original) The method of claim 36 wherein said determining and said supplying occur in a plurality of user space processes.

38. (Currently Amended) A computer implemented method of managing computer resources over a plurality of workloads, said method comprising:

for each workload of said plurality of workloads, monitoring respective workload resource usage against a respective allotment of each workload;

determining a range of computer resources to page out for each workload whose resource usage exceeds its respective allotment; and

initiating a paging out operation of said range of computer resources and wherein said monitoring, said determining and said initiating all occur within a process of user space,

wherein each of the plurality of workloads exists within a user space and includes a plurality of running processes, the plurality of running processes are a subset of all processes that are running in the user space.

39. (Original) The method as described in claim 38 wherein said determining comprises determining least recently used pages for each workload whose resource usage exceeds its respective allotment.

40. (Original) The method as described in claim 38 wherein said process is situated within a workload of said plurality of workloads.

41. (Original) The method as described in claim 38 further comprising paging out said range of computer resources and wherein each workload whose resource usage exceeds its

respective allotment remains partially operable during said paging out of its respective range of computer resources.

42. (Currently Amended) A computer system comprising:

a bus for functionally coupling elements of said computer system; physical memory coupled to said bus for storing processor instructions and data;

a processor coupled to said bus and for implementing a method, said method comprising:

accessing an amount of computer system resources allocated to a workload of said computer system, the workload exists within the user space and includes a plurality of running processes, the plurality of running processes are a subset of all processes that are running in the user space;

monitoring computer resource usage of said workload; and

determining a range of computer resources to make available for ~~other~~ use by other workloads provided said computer resource usage of said workload exceeds said amount of computer resources allocated to said workload, wherein said monitoring and said determining occur within said workload, the computer resources being made available to other workloads by paging out least recently used physical memory pages assigned to said workload.

43. (Original) The computer system of claim 42 wherein said computer resources comprises physical memory.

44. (Original) The computer system of claim 42 wherein said computer resources comprises virtual memory.

45. (Original) The computer system of claim 42 wherein said computer resources comprises central processing unit time.

46. (Original) The computer system of claim 42 wherein said computer resources comprises input/output space.

47. (Original) The computer system of claim 42 wherein said computer resources comprises network bandwidth.

48. (Currently Amended) A computer system comprising:

first and second computers coupled via a network; said first computer for implementing a method,

said method comprising:

accessing an amount of computer system resources allocated to a workload of said second computer, the workload exists within a user space and includes a plurality of running processes, the plurality of running processes are a subset of all processes that are running in the user space;

monitoring computer system resource usage of said workload;

determining, at said first computer, a plurality of computer system resources to make available for ~~other~~ use by other workloads provided said computer resource usage of said workload exceeds said amount of computer resources allocated to said workload, the plurality of computer resources being made available to other workloads by paging out least recently used physical memory pages assigned to said workload; and

making, at said second computer, at least one of said plurality of computer system resources available for other use.

49. (Original) The computer system of claim 48 wherein said computer resources comprises physical memory.

50. (Original) The computer system of claim 48 wherein said computer resources comprises virtual memory.

51. (Original) The computer system of claim 48 wherein said computer resources comprises central processing unit time.

52. (Original) The computer system of claim 48 wherein said computer resources comprises input/output space.

53. (Original) The computer system of claim 48 wherein said computer resources comprises network bandwidth.